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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-------------------------------------|-------------|------------------------|---------------------|------------------|
| 10/707,388 | 12/10/2003 | Ramachandra Divakaruni | FIS920030274 | 1387 |
| 23550 | 7590 | 07/28/2005 | EXAMINER | |
| HOFFMAN WARNICK & D'ALESSANDRO, LLC | | | FULK, STEVEN J | |
| 75 STATE STREET | | | ART UNIT | |
| 14TH FL | | | PAPER NUMBER | |
| ALBANY, NY 12207 | | | 2891 | |

DATE MAILED: 07/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H.A

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/707,388 | DIVAKARUNI ET AL. | |
| | Examiner | Art Unit | |
| | Steven J. Fulk | 2891 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 1-11 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12/10/03 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group III, claims 12-20, in the reply filed on 29 June 2005 is acknowledged. The traversal is on the ground(s) that the Office failed to prove a serious burden exists when searching Groups I and II separately from Group III. This is not found persuasive because the accepted tests set forth in MPEP § 803 for establishing a prima facie case of burden have been satisfied, as such the burden has shifted to the applicant and the applicant has failed to rebut. Applicant has also argued that the restriction between Group II and Group I as combination and subcombination is improper. However the restriction of Group III from Groups I and II is still proper and neither Group I nor Group II has been elected, therefore the arguments for Groups I and II are moot. If the issue of rejoinder of the method claims of Group I and/or Group II arises, the question of combination and subcombination can be addressed at that time.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject

matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 12 – 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goto et al. '880 in view of Wolf.

Goto et al. discloses a semiconductor device comprising a silicide resistor with a polysilicon base positioned below the silicide section (paragraph 28). The reference does not disclose using a silicide resistor in a plurality of back-end-of-line layers with a silicidation temperature less than a damaging temperature of the BEOL layers, nor does Goto et al. disclose the specifics of the silicide material properties. Wolf teaches that group VIII metals (cobalt, palladium, platinum, and nickel) form silicides with polysilicon at temperatures of 600 °C or less which would not damage BEOL layers (vol. II, page 146), and tungsten and molybdenum form silicides at 600 °C or more (vol. I, page 387,400). Wolf also teaches the respective resistivities of silicides formed from cobalt, palladium, platinum, and nickel are 16-18, 30-35, 28-30, and 50 micro-ohms/cm (vol. II, page 146). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a silicide material described by Wolf in the resistor of Goto et al. because the resistor could be formed in any layer of the semiconductor device, including BEOL layers, without causing thermal damage to the layer.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references disclose semiconductor devices with silicide resistors:

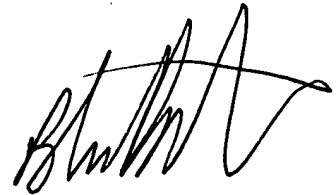
- a. Ishikura et al. '764.
- b. Kadosh et al. '398.
- c. Gregor et al. '339.
- d. Ng et al. '098.
- e. Wada et al. '157.
- f. Ballantine et al. '214.
- g. Liu et al. '833.
- h. Coolbaugh et al. '185.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven J. Fulk whose telephone number is (571) 272-8323. The examiner can normally be reached on Monday through Friday, 8:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Baumeister can be reached on (571) 272-1722. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

sjf
7/11/05

A handwritten signature in black ink, appearing to read 'B. William Baumeister', with a stylized, flowing script.

**B. WILLIAM BAUMEISTER
SUPERVISORY PATENT EXAMINER**